# APPENDIX C

**(CLEAN VERSION OF ALL PENDING CLAIMS)**

**(Serial No. 09/934,175)**

CLAIMS

What is claimed is:

1. A spring contact for establishing electrical contact with a lead element extending from an IC device, comprising:

a base portion configured for securing said spring contact within an aperture formed in a substrate and for establishing electrical contact with said substrate; and

a contact portion connected to said base portion, said contact portion comprising an elongated member formed into a resiliently compressible coil spring configured to bias against and electrically contact said lead element of said IC device.

2. The spring contact of claim 1, wherein said contact portion is further configured for at least partially aligning said lead element of said IC device relative to said spring contact.

3. The spring contact of claim 1, wherein said contact portion comprises a generally hemispherical coil spring, a generally conical coil spring, or a generally cylindrical coil spring.

4. The spring contact of claim 1, wherein said contact portion comprises a cone-shaped coil spring having an apex for contacting said lead element of said IC device.

5. The spring contact of claim 1, wherein said base portion comprises a cantilever spring.

6. The spring contact of claim 1, further comprising at least one contact element disposed on said contact portion.

7. The spring contact of claim 6, wherein said at least one contact element is selected from a group consisting of at least one substantially sharp edge on the elongated member, at least one blade extending longitudinally on the elongated member, at least one blade extending circumferentially about the elongated member, at least one blade extending helically about the elongated member, a barb, a protrusion, and a roughened surface.

8. The spring contact of claim 1, wherein said base portion and said contact portion comprise a single piece of material.

9. A device for establishing electrical contact between a lead element extending from an IC device and a substrate, comprising:

a spring contact including a base portion and a contact portion, said contact portion comprising a resiliently compressible coil spring configured to bias against and electrically contact said lead element of said IC device; and

an aperture opening onto one surface of said substrate and extending a depth at least partially into said substrate, said aperture configured to receive and electrically contact said base portion of said spring contact.

10. The device of claim 9, said aperture extending through said substrate and opening onto an opposing surface thereof.

11. The device of claim 9, further comprising a layer of conductive material disposed on at least a portion of an interior wall of said aperture, said layer of conductive material electrically contacting said base portion of said spring contact.

12. The device of claim 11, wherein said layer of conductive material is electrically connected to a conductive trace formed on said one surface of said substrate.

13. The device of claim 11, wherein said layer of conductive material is electrically connected to an intermediate conductive plane of said substrate.

14. The device of claim 11, wherein said aperture extends through said substrate and opens onto an opposing surface thereof and said layer of conductive material is electrically connected to a conductive trace formed on said opposing surface of said substrate.

15. The device of claim 9, further comprising a volume of conductive filler material disposed in said aperture and electrically contacting said base portion of said spring contact.

16. The device of claim 15, wherein said conductive filler material is electrically connected to a conductive trace formed on said one surface of said substrate.

17. The device of claim 15, wherein said conductive filler material is electrically connected to an intermediate conductive plane of said substrate.

18. The device of claim 15, wherein said aperture extends through said substrate and opens onto an opposing surface thereof and said conductive filler material is electrically connected to a conductive trace formed on said opposing surface of said substrate.

19. The device of claim 9, wherein said aperture includes:

a seat portion configured to receive said contact portion of said spring contact, one end of said seat portion opening onto said one surface of said substrate; and

a retaining portion configured to receive said base portion of said spring contact, said retaining portion having a first end connected to an opposing end of said seat portion and a second end extending said depth into said substrate.

20. The device of claim 19, said second end of said retaining portion opening onto an opposing surface of said substrate.

21. The device of claim 19, wherein said seat portion comprises a generally hemispherical recess formed in said one surface of said substrate, a generally conical recess formed in said one surface of said substrate, or a generally cylindrical recess formed in said one surface of said substrate.

22. The device of claim 19, wherein said seat portion is further configured to at least partially align said lead element of said IC device relative to said spring contact.

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23. (Amended) The device of claim 9, wherein said contact portion of said spring contact comprises a resiliently compressible coil spring having at least two spring coils for contacting portions thereof and configured to bias against and electrically contact said lead element of said IC device.

24. An electrical component, comprising:

at least one IC device having a plurality of lead elements extending therefrom;

a substrate having a first surface and an opposing second surface;

a plurality of apertures opening onto at least said first surface of said substrate, said plurality of apertures arranged in a pattern corresponding to a footprint of said plurality of lead elements extending from said at least one IC device;

a plurality of spring contacts, each spring contact of said plurality of spring contacts including a base portion and a contact portion, said base portion secured within one aperture of said plurality of apertures and electrically connected to said substrate, said contact portion comprising a resiliently compressible coil spring biased against and electrically contacting one lead element of said plurality of lead elements of said at least one IC device; and

at least one clamping element securing said at least one IC device to said first surface of said substrate and biasing each lead element of said plurality of lead elements of said at least one IC device against said contact portion of one spring contact of said plurality of spring contacts.

25. The electrical component of claim 24, wherein said base portion of said each spring contact is secured within said one aperture by frictional forces.

26. The electrical component of claim 24, wherein said base portion of said each spring contact is secured within said one aperture by an electrically conductive bonding agent.

27. (Amended) The electrical component of claim 24, wherein said at least one clamping element comprises a stab-in-place clip.

28. (Amended) The electrical component of claim 24, further comprising:

a second IC device having a plurality of lead elements extending therefrom;

a second plurality of apertures opening onto at least said second surface of said substrate, said second plurality of apertures arranged in a pattern corresponding to a footprint of said plurality of lead elements extending from said second IC device;

a second plurality of spring contacts, each spring contact of said second plurality of spring contacts including a base portion and a contact portion, said base portion secured within one aperture of said second plurality of apertures and electrically connected to said substrate, said contact portion comprising a resiliently compressible coil spring biased against and electrically contacting one lead element of said plurality of lead elements of said second IC device; and

at least another clamping element securing said second IC device to said second surface of said substrate and biasing each lead element of said plurality of lead elements of said second IC device against said contact portion of one spring contact of said second plurality of spring contacts.

29. (Amended) The electrical component of claim 24, wherein each resiliently compressible coil spring includes at least two coils for contacting portions of each other when biased against and electrically contacting one lead element of said plurality of lead elements of said at least one IC device.

30. (Amended) A method of establishing an electrical connection between a substrate and a lead element extending from an IC device, comprising:

providing an aperture in said substrate opening onto at least one surface of said substrate;

securing at least a portion of a spring contact within said aperture and leaving another portion of said spring contact free to move;

establishing electrical contact between said at least a portion of said spring contact and said substrate;

directly contacting said lead element of said IC device against said another portion of said spring contact;

securing said IC device to said at least one surface of said substrate to bias said lead element of said IC device against said spring contact and to compress said another portion of said spring contact.

31. The method of claim 30, further comprising at least partially aligning said lead element of said IC device relative to said spring contact using said another portion of said spring contact.

32. The method of claim 30, further comprising at least partially aligning said lead element of said IC device relative to said spring contact using a seat provided by said aperture.

33. (Amended) The method of claim 30, further comprising compressing said at least a portion of said spring contact against said another portion thereof for making electrical contact therewith.

34. (Amended) A method of establishing an electrical connection between a substrate and a plurality of lead elements extending from an IC device, comprising:

providing a plurality of apertures in said substrate arranged in a pattern corresponding to a footprint of said plurality of lead elements of said IC device, each aperture of said plurality of apertures opening onto at least one surface of said substrate;

disposing a plurality of spring contacts in said plurality of apertures in a manner wherein at least a portion of each spring contact of said plurality of spring contacts is secured within one aperture of said plurality of apertures and another portion of said each spring contact is free to move;

establishing electrical contact between said at least a portion of said each spring contact of said plurality of spring contacts and said substrate;

directly contacting each lead element of said plurality of lead elements of said IC device against said another portion of one spring contact of said plurality of spring contacts;

securing said IC device to said at least one surface of said substrate to bias said each lead element of said plurality of lead elements of said IC device against said one spring contact of said plurality of spring contacts and to compress said another portion of said one spring contact.

35. The method of claim 34, further comprising at least partially aligning said IC device relative to said substrate using said plurality of spring contacts.

36. The method of claim 34, further comprising at least partially aligning said IC device relative to said substrate using said plurality of apertures.

37. The method of claim 34, further comprising compressing a segment of said another portion of said one spring contact against another segment thereof to make electrical contact therewith.

38. The method of claim 37, further comprising reducing a length of an electrical path through at least one of said spring contacts responsive to said compression of said one segment of said another portion of at least one of said spring contacts against said another segment thereof.

39. The method of claim 38, further including reducing an inductance associated with said electrical path through said one spring contact responsive to said reduction of said electrical path length.

40. The method of claim 34, further comprising reducing a length of an electrical path through at least some of said spring contacts responsive to said compression of said another portion of said one spring contact.

41. The method of claim 40, further including reducing an inductance associated with said electrical path through said one spring contact responsive to said reduction of said electrical path length.